BALTIMORE CITY
STORMWATER MANAGEMENT
MANUAL

Prepared for:
Baltimore City
Department of Public Works

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Attachments

1 Introduction

1.1 Purpose of the Supplement

The purpose of this manual is to present the procedures used by the Baltimore City Department of Public Works to administer the stormwater management ordinance (City ordinance 02-367).

The City of Baltimore, as the largest existing urban center in the State of Maryland, faces a number of special concerns related to the implementation of the new State stormwater management criteria. Most stormwater management programs are directed at new development and traditionally have not addressed the needs of existing urban areas such as Baltimore City, very well, if at all. Most of the guidance for stormwater management control is focused on newly developing suburban areas and are based on the use of end of pipe control technology that requires a considerable amount of space, which is often not available or practical in older urban areas.

In contrast to the suburban development scenario, most development in existing urban centers such as Baltimore City consists of infill parcels or redevelopment of existing, older areas. As a result, many of the standard Best Management Practices (BMPs) contained in the 2000 Maryland Stormwater Design Manual, such as extended detention, wet ponds, and wetlands may not be suitable because of space constraints or underlying soil conditions.

Attachment D presents a number of innovative ultra urban Best Management Practices, which may be better suited for use in urban areas. The Baltimore Department of Public Works is willing to consider these practices, especially where the practices in the 2000 Maryland Stormwater Design Manual are infeasible.

1.2 Scope of Supplement

This manual provides guidance for the Baltimore City stormwater management regulatory program. The program includes the Baltimore City Stormwater Management ordinance (City ordinance 02-367) and the 2000 Maryland Stormwater Design Manual. The manual includes procedures for waivers, variances, concept plan submission, and plan review. This manual identifies and describes maintenance and monitoring requirements for stormwater management facilities. This guidance includes scheduling of inspections and maintenance activities, maintenance standards, monitoring requirements, and inspection requirements.

2 Stormwater Management Plans

2.1 Overview

Land development and construction projects in Baltimore City are subject to a number of permitting and approval processes, which are administered by the Departments of Housing, and Community Development, (HCD), Planning (DP), and Public Works (DPW). Each agency's role in the permitting process is described in the " Development Guidebook: Requirements for Building in Baltimore City," which is distributed by the Baltimore City Department of Planning.

Figure 2.1 outlines the process involved in the administration of the stormwater management requirements in accordance with the Baltimore City Stormwater Management ordinance (City Ordinance 02-367).

2.2 Exemptions

All development, building and land disturbance activities require stormwater management except:

- agricultural activities; and
- construction, grading, or development that does not disturb more than 5,000 square feet.

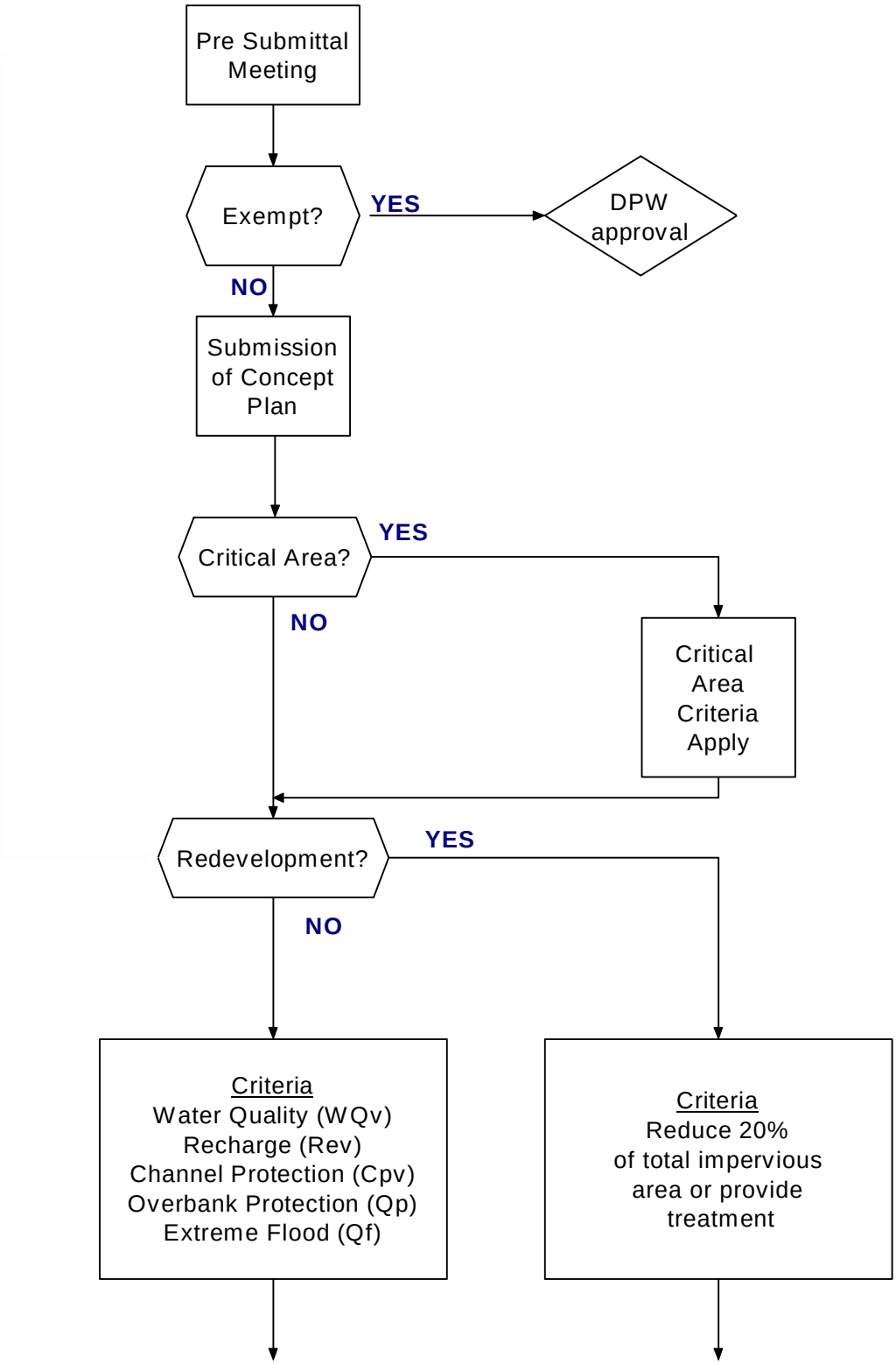
Stormwater management at State regulated project sites such as mines and landfills are regulated by the State agencies. Stormwater plans for these projects should not be submitted to the Department.

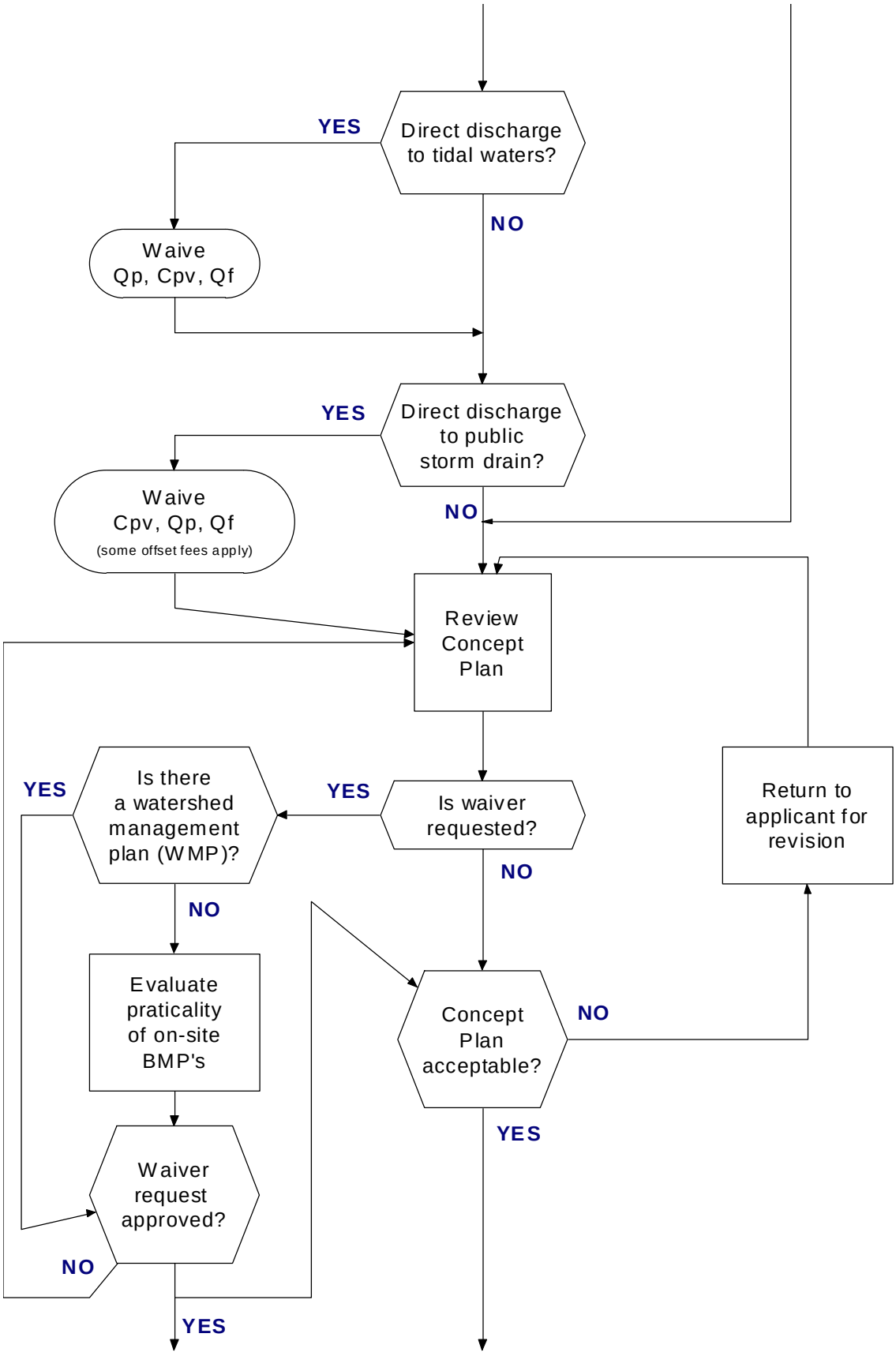
2.3 Minimum Control Requirements

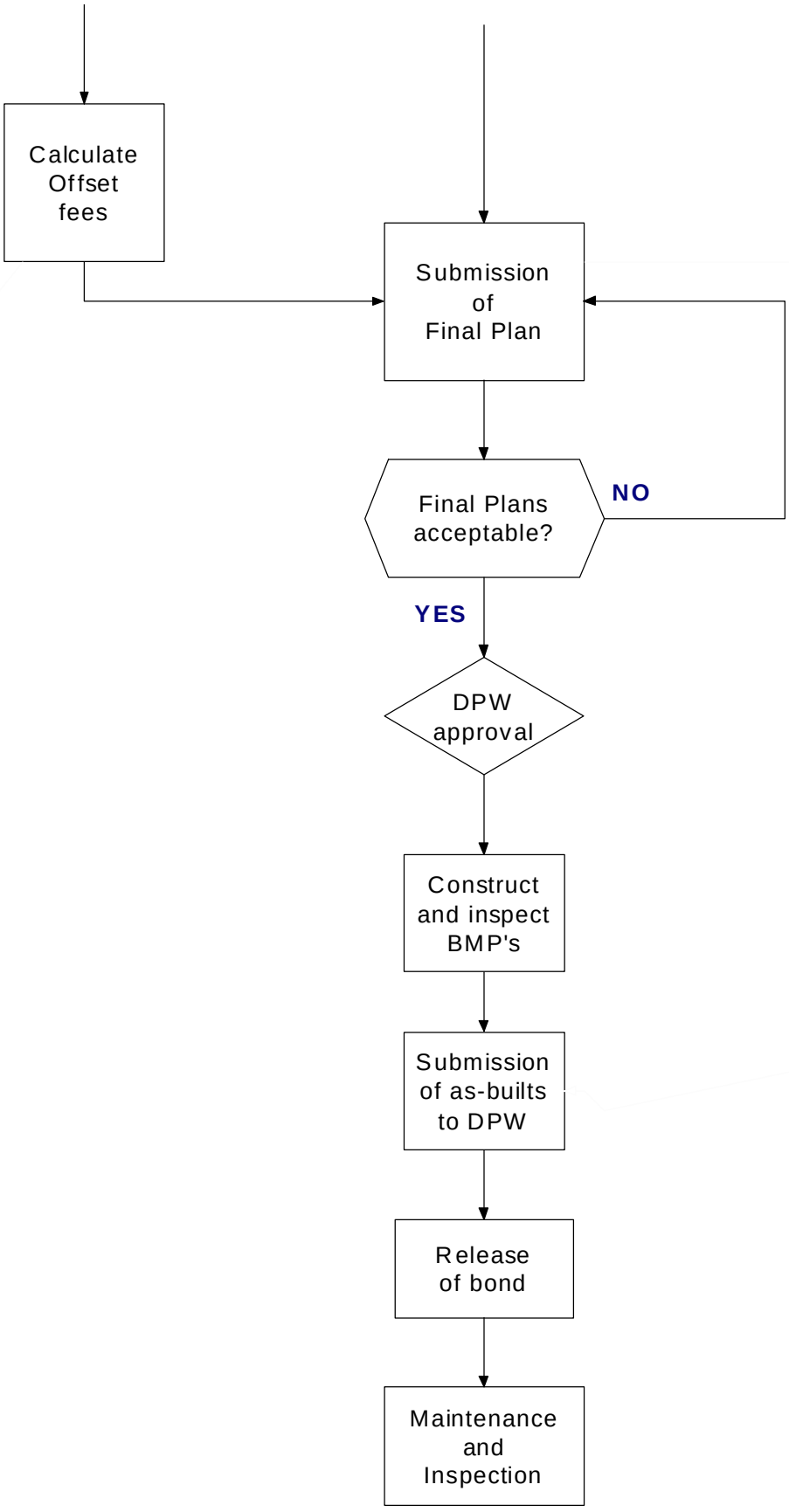
The City of Baltimore stormwater management program follows the State of Maryland program. The procedures to follow are detailed in the 2000 Maryland Stormwater Design Manual, Volumes I and II, hereinafter referred to as the Design Manual.

The water quality volume, the recharge volume, and the channel protection storage volume sizing criteria shall be used to design BMP's according to the Design Manual. Control of the 24-hour, 10-year frequency storm event is required using practices consistent with the Design Manual.

Figure 2-1 Baltimore City Stormwater Management Review/Approval Process




Direct discharge to tidal waters?
YES
NO
Waive Qp, Cpv, Qf
Direct discharge to public storm drain?
YES
NO
Waive Cpv, Qp, Qf
(some offset fees apply)
Review Concept Plan
Is there a watershed management plan (WMP)?
YES
Is waiver requested?
YES
Return to applicant for revision
NO
NO
Evaluate praticality of on-site BMP's
Concept Plan acceptable?
NO
YES
Waiver request approved?
NO
YES


Calculate Offset fees
Submission of Final Plan
Final Plans acceptable?
NO
YES
DPW approval
Construct and inspect BMP's
Submission of as-builts to DPW
Release of bond
Maintenance and Inspection

Watersheds with known flooding hazards shall require management measures necessary to maintain the post-development peak discharges for the 24-hour, 100-year frequency storm events at a level that is equal to, or less than the 24-hour 100-year pre-development peak discharge rates. The stormwater management practices shall control the volume, timing, and rate of flows necessary to maintain a "no increase" in the downstream peak discharge for the 100-year frequency storm event.

The Department may require more than the minimum control requirements specified in these Guidelines if hydrologic or topographic conditions warrant, or if flooding, stream channel erosion, or water quality problems exist downstream from a proposed project.

2.4 Structural and Nonstructural Practices

2.4.1 Nonstructural Stormwater Management Measures.

1) The following nonstructural stormwater management practices shall be applied according to the Design Manual to minimize increases in new development runoff:
   a. natural area conservation;
   b. disconnection of rooftop runoff;
   c. disconnection of non-rooftop runoff;
   d. sheet flow to buffers;
   e. grass channels; and
   f. environmentally sensitive development.

2) The use of nonstructural stormwater management practices shall be strongly encouraged to minimize the reliance on structural BMP's.

3) The minimum control requirements listed in these Guidelines may be reduced in accordance with the Design Manual when nonstructural stormwater management practices are incorporated into site designs.

4) The use of nonstructural stormwater management practices may not conflict with existing State laws, regulations, or policies.

5) Nonstructural stormwater management practices used to reduce the minimum control requirements must remain unaltered by owners. Approval from the Department shall be obtained prior to alteration of nonstructural stormwater practices.

6) For the purposes of modifying the minimum control requirements or design criteria, the applicant shall submit to the Department an analysis of the impacts of stormwater flows downstream in the watershed. The analysis shall include hydrologic and hydraulic calculations necessary to determine the impact of hydrograph timing modifications of the proposed development upon a dam, highway, structure, or natural point of restricted streamflow. The point of investigation is to be established, with the concurrence of the Department, at the first downstream tributary whose drainage area equals, or exceeds, the contributing area to the project or stormwater management facility.

2.4.2 Structural Stormwater Management Measures.

1) The following structural stormwater management practices shall be designed according to the Design Manual to satisfy the applicable minimum control requirements:

   a. Stormwater management ponds;

   b. Stormwater management wetlands;

   c. Stormwater management infiltration;

   d. Stormwater management filtering systems; and

   e. Stormwater management open channel systems.

2) The performance criteria specified in the Design Manual with regard to general feasibility, conveyance, pretreatment, treatment and geometry, environment and landscaping, and maintenance shall be considered when selecting structural stormwater management practices.

3) Structural stormwater management practices shall be selected to accommodate the unique hydrologic or geologic regions of the site.

4) Recycling of stormwater runoff will be considered to be treatment to the extent that recycled runoff does not leave the site.

2.4.3 Specific Design Criteria.

The basic design criteria, methodologies, and construction specifications, subject to the approval of the Department, shall be those of the Design Manual.

A. Infiltration systems shall be designed in accordance with the Design Manual and shall meet the following requirements:

   The facility design shall provide an overflow system with measures to provide a non-erosive velocity of flow along its length and at the outfall. Infiltration trenches shall be provided with observation wells in accordance with the Design Manual.

B. Ponds, wetlands, filtering systems and open channel systems shall be designed and constructed in accordance with the Design Manual and shall include the following items:

   1) Velocity dissipation devices shall be placed at the outfall of all detention or retention structures and along the length of any outfall channel as necessary to provide a non-erosive velocity of flow from the structure to a water course.

   2) Where deemed necessary by the Department, the applicant shall submit an analysis of the impacts of stormwater flows downstream in the watershed. The analysis shall include hydrologic and hydraulic calculations necessary to determine the impact of hydrograph timing modifications resulting from the proposed development upon a dam, highway, structure, or natural

point of restricted stream flow, established with the concurrence of the Department, and shall extend downstream to the first downstream tributary whose drainage area equals or exceeds the contributing area to the pond; or to the first downstream tributary whose peak discharge exceeds the largest designed release rate of the pond.

3) The designed release rate of the facility shall be modified if any increase in flooding or stream channel erosion would result at the downstream dam, highway, structure, or natural point of restricted stream flow. The release rate of the facility shall:

   a. Be reduced to a level that will prevent any increase in flooding or stream channel erosion at the downstream control point;

   b. Be not less than 1-year pre-development peak discharge rate; and

   c. Meet the minimum requirements established in the State Design Manual.

4) Where the selected BMP is a pond, small pond approval shall be obtained from the Department.

C. Off-site structures to be considered:

1) Shall have a contributory drainage area not in excess of 400 acres unless, on a case by case basis, a larger drainage area is approved by the Department;

2) Shall provide for a permanent pool of water or provide for 24-hour detention period (a 12-hour detention period may be approved, at the discretion of the Department, for Use III or Use IV streams) for detaining and releasing the volume of runoff from the 1-year frequency storm;

3) Shall manage the increase in peak discharges for the 10 and possibly the 100-year frequency storm events; and

D. When calculating the overbank flood protection (Qp10) the pre-development peak discharge rate shall be computed assuming that all land uses within the project site are in good hydrologic condition.

1) Design considerations shall be given for incorporating the use of natural topography and land cover, such as wetlands, ponds, natural swales, and depressions, as they exist prior to development, to the degree that they can accommodate the increased flow of water.

2) Where deemed necessary, due to increased volume or rate of discharge from the project site, the Department may require easements or other necessary property interests, concerning flowage of water, from adjacent property owners. It shall be the responsibility of the applicant to provide said easements or other necessary property interests. Approval of a stormwater management plan does not create or affect any such rights.

E. Water quality treatment for roadway and/or parking lot construction shall be in accordance with the Design Manual and the following:

1) Grassed Channel Water Quality Credit.

a. When computing the discharge for the water quality storm for grassed channel credit, the out-of-project (off-site) drainage area contributing runoff to the grassed channel must be included.

b. Credit may be applied only for that portion of the impervious area that reaches the grassed channel via sheet flow or approved pretreatment practice.

c. When expanding the limits of paving, grassed channel credit will be applied as follows:

(1) the length of the post-development vegetative buffer (the grassed area between the edge of the paving and the centerline of the channel) shall be proportional to the ratio of the pre-development buffer/paving lengths; for EXAMPLE: *the pre-development buffer length (the length of vegetated buffer receiving sheet flow from the existing paved area) equals 50 feet. The pre-development paving length sheet flowing to the buffer equals 25 feet. The pre-development ratio of buffer/paving equals 50/25 or 2/1. The post-development paving length (the length of paving that sheet flows to the grassed buffer) equals 35 feet. Therefore, maintaining the 2/1 ratio, the post-development vegetated buffer length must equal 70 feet minimum.*

(2) where the buffer/paving length ratio cannot be provided, the Department may consider, on a case by case basis, mitigation for reduced buffer length in the form of landscaping and/or grading.

2) Conversion of open section paving to closed section.

a. Quantifying efficiency of water quality treatment provided by existing conditions.

The presence of an existing vegetated filter strip through which runoff sheet flows is an effective water quality measure for the runoff from existing open section paving. Likewise, the presence of an existing vegetated conveyance (swale or channel) that transports the runoff from a "one-inch rainfall" event, at a velocity of 1 fps or less, is an effective water quality measure. When converting open section paving to closed section, the quality of runoff may be negatively impacted due to the loss of these vegetative filtering and/or infiltration measures. This existing water quality value shall be quantified as follows:

(1) Step 1

• Enter Figure 2-2 with the appropriate slope and read the filter length required to achieve removal goals for total suspended solids (TSS).

• Determine the length of the existing filter.

• The ratio of the existing filter length to the filter length obtained from Figure 2-2 is the efficiency.

(2) Step 2

• Determine the velocity of the runoff from the one-inch rainfall event in the existing swale/channel.

• Determine the filter efficiency as follows: a velocity of 1 fps or less, equals 100% water quality (WQ) efficiency; a velocity of 3 fps or greater equals 0% water quality efficiency. The efficiency is directly proportional to the velocities of the one-inch rainfall within the existing conveyance.

(3) Step 3

• The greater of the Step 1/Step 2 efficiencies is the percent of water quality provided by the existing conditions.

b. Compensation for the percent of water quality provided by the existing conditions shall be as follows: The area of the existing impervious surface converted from open section to closed section shall be multiplied by the percent of water quality provided by the existing conditions (as determined in Step 3 above). Water quality shall be provided for this area of existing paving due to the conversion of open section to closed section.

3) Conversion of closed section pavement to open section.

Water quality compensation for conversion of closed section paving to open section paving may be quantified by use of Steps 1 through 3 in Subsection 2.4.3.E.2.a.

4) Compensating Water Quality Treatment (WQv and Rev)

a. Projects may have drainage areas where it is not possible to provide water quality treatment for all new paved areas. Compensating water quality treatment of existing paving, equal to 120% of the untreated new paved area, may be provided elsewhere within the same watershed. Provision of the compensating water quality treatment shall be included within the project.

b. In order for existing paving to qualify as compensating water quality treatment, there must be no, or substandard, existing water quality treatment for said existing paving. Substandard means less than 100 percent (%), as determined by the method in Subsection 2.4.3.E.2.a. of these Guidelines.

Figure 2-2

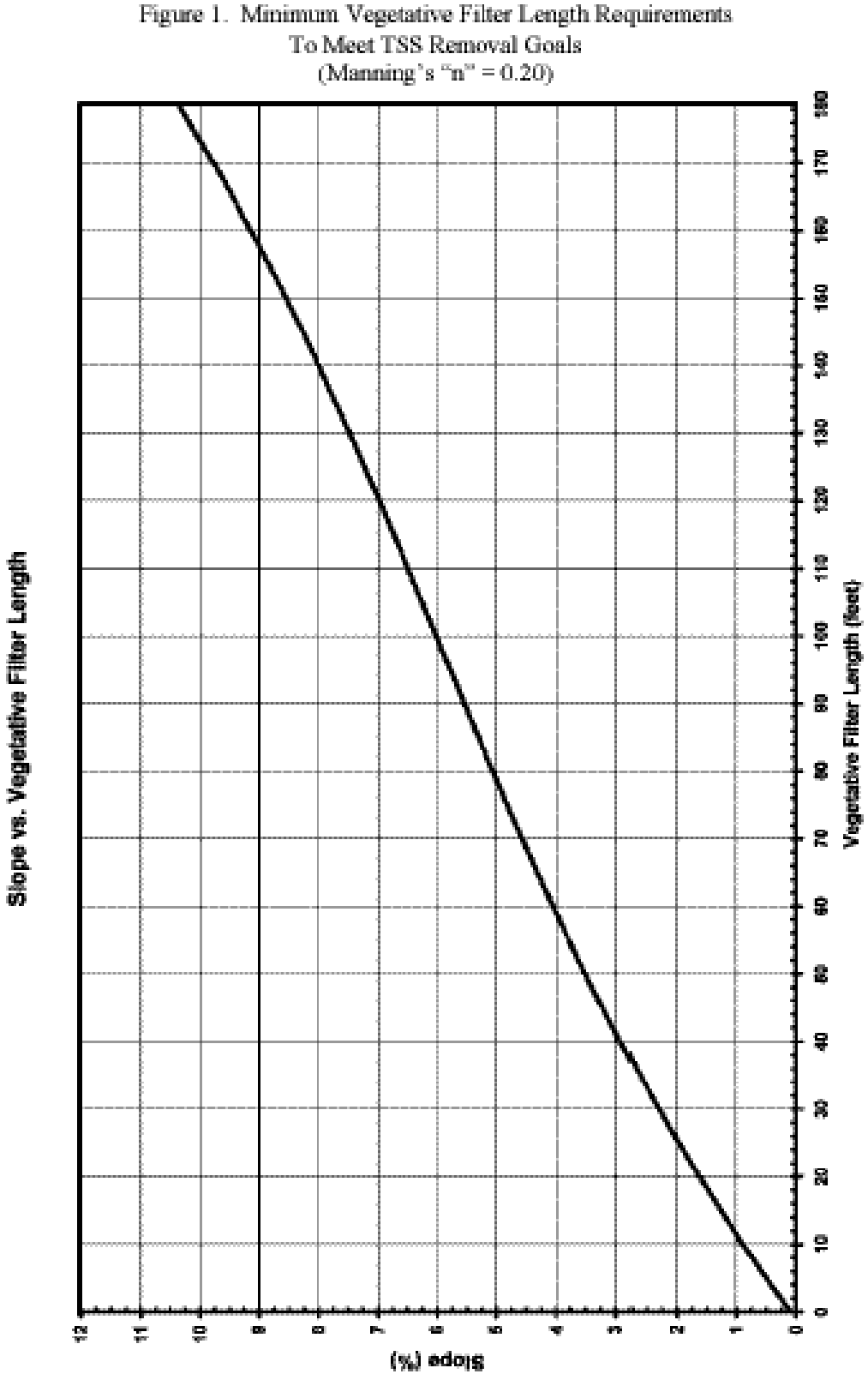


Figure 1. Minimum Vegetative Filter Length Requirements
To Meet TSS Removal Goals
(Manning's "n" = 0.20)
Slope vs. Vegetative Filter Length
Slope (%)
Vegetative Filter Length (feet)
0
1
2
3
4
5
6
7
8
9
10
11
12
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
180

5) On-Line BMPs

Water quality practices that are placed On-Line (in medians or side channels/ditches/swales) shall include offsite impervious area in the calculation of the water quality requirements.

F. Channel Protection Volume (Cpv)

Channel Protection Volume (Cpv) shall be derived in accordance with the Design Manual.

Extended detention facilities for projects that include combined redevelopment and new development, shall be in accordance with the following:

1) Cpv shall be computed using the new development drainage area only.

2) The extended detention facility may be designed to control the Cpv, as computed in accordance with Subsection 2.4.3.F.1. of these Guidelines, and by-pass the excess runoff contribution from the redevelopment portion of the contributing drainage area.

2.5 Concept Plans

If a proposed project does not qualify for an exemption, the applicant should proceed to prepare a Stormwater Management Concept Plan. A Stormwater Management Concept Plan Application Form is provided in Attachment B. The purpose of the concept plan is to let the department have the opportunity to review the stormwater management planned for a site before final design is completed. This concept plan will be submitted to the Department of Public Works Development Center for review and approval. Approval of the Concept Plan is required before the applicant can proceed to submission of construction drawings for technical stormwater approval. The Concept Plan will provide the following information:

1) Project Location and description
2) Applicant's Name and address
3) Owner's Name and address
4) Type of development/Overview of Project/Land use
5) Approximate Maryland State Plane coordinates
6) ADC map location
7) Drainage area and watershed
8) 100-year Floodplain location, if applicable
9) Proposed stormwater management controls and unified sizing criteria volume computations including disturbed area
10) Waiver requests, if any
11) Site plan showing topography and vicinity map

Attachment B is an application form and checklist for the concept plan submittal. If a waiver or variance is requested, the request should be in the concept plan submittal.

2.6 Construction Drawings and Reports

2.6.4 Review and Approval of Stormwater Management Plans.

For any proposed development, the developer shall submit a stormwater management plan or waiver application to the Department for review and approval, unless otherwise exempted. The stormwater management plan shall contain supporting computations, drawings, and sufficient information describing the manner, location, and type of measures in which stormwater runoff will be managed from the entire development. The Department shall review the plan to determine compliance with the requirements of the Stormwater Management ordinance prior to approval. The plan shall serve as the basis for all subsequent construction.

Notification of approval or reasons for disapproval or modification shall be given to the applicant within 30 days after submission of the completed stormwater plan. If a decision is not made within 30 days the applicant shall be informed of the status of the review process and the anticipated completion date. The stormwater management plan shall not be considered approved without the inclusion of the signature and date of signature of the Department.

2.6.5 Contents of the Stormwater Management Plan.

The developer is responsible for submitting a stormwater management plan that meets the design requirements of the Ordinance. The plan shall be accompanied by a report that includes sufficient information to evaluate the environmental characteristics of affected areas, the potential impacts of the proposed development on water resources, and the effectiveness and acceptability of measures proposed for managing stormwater runoff. The developer or builder shall certify on the drawings that all clearing, grading, drainage, construction, and development shall be conducted in strict accordance with the plan. The minimum information submitted for support of a stormwater management plan or application for a waiver shall be as follows:

Reports submitted for stormwater management plan approval shall include:

1) A brief narrative description of the project;
2) Geotechnical investigations including soil maps, borings, site specific recommendations, and any additional information necessary for the proposed stormwater management design;
3) Descriptions of all water courses, impoundments, and wetlands on or adjacent to the site or into which stormwater directly flows;
4) Hydrologic computations, including drainage area maps (scale of 1"=200') depicting pre development and post development runoff flow path segmentation and land use;
5) Hydraulic computations;
6) Structural computations;
7) Copies of all permits required by the project;
8) Construction cost estimate;
9) Completed checklist (see Attachment F);

10) Unified sizing criteria volume computations according to the Maryland Design Manual; and
11) Any other information required by the Department.

Construction drawings (scale of 1"=10', 20', 30', 40' or 50') submitted for stormwater management plan approval shall include the following:

1) A vicinity map at a scale of 1"=2000';
2) Topography survey showing existing and proposed contours, including the area necessary to determine downstream analysis for proposed stormwater management facilities;
3) Any proposed improvements including location of buildings or other structures, impervious surfaces, storm drainage facilities, and all grading;
4) The location of existing and proposed structures and utilities;
5) Any easements and rights-of-way;
6) The delineation, if applicable, of the 100-year floodplain and any on site wetlands;
7) Structural and construction details for all components of the proposed drainage system or systems, and stormwater management facilities.
8) All necessary construction specifications including materials, source of materials, and name of suppliers (sources and suppliers may be furnished at preconstruction meeting);
9) A sequence of construction;
10) Data for total site area, disturbed area, new impervious area, and total impervious area;
11) A table showing the unified sizing criteria volumes required in the Maryland Design Manual;
12) A table of materials to be used for stormwater management facility planting;
13) All soil boring logs and locations;
14) A maintenance schedule;
15) Certification by the owner/developer that all stormwater management construction will be done according to this plan (see Attachment H);
16) An as-built certification signature block to be executed after project completion (see Attachment H);
17) An engineer's certification (see Attachment H);
18) A maintenance and liability certification (see Attachment H);
19) A proposed construction and inspection control schedule; and
20) Any other information required by the Department.

2.6.6 Preparation of the Stormwater Management Plan.

The design of stormwater management plans shall be prepared by either a professional engineer, professional land surveyor, or landscape architect licensed in the State, as necessary to protect the public or the environment.

If a stormwater BMP requires a dam safety permit from MDE, a professional engineer licensed in the State must prepare the design.

2.7 Waivers

The Department may grant a waiver of the stormwater management QUANTITY and QUALITY or only QUALITY control requirements where the Applicant can demonstrate to the satisfaction of the Department that:

1. the project shall return the disturbed area to a predevelopment runoff condition (no hydrologic change and/or redevelopment occurs), i.e., pipeline or conduit projects, certain landscaping projects, certain maintenance projects, certain underground projects; or
2. the project lies within an area with an approved watershed management plan; or the project lies within an approved master plan that has been developed consistent with Section 2.9.

The Department may grant a waiver of the stormwater management QUANTITY control requirements where the Applicant can demonstrate to the satisfaction of the Department that:

1. the impervious area created by the project does not exceed six (6) feet in width, is linear in nature, i. e., bike paths, walkways, highway noise barriers, etc., and retains the predevelopment drainage patterns; or
2. the project is served by an existing public storm drain system; or
3. the project has direct discharge to tidally influenced receiving waters.

A request for a Waiver shall be submitted as part of the concept plan and shall specifically state the item of this section for which the project is eligible. The applicant shall provide sufficient descriptions, drawings, and other information necessary to evaluate the proposed project and confirm the applicability of the waiver request. Any waiver shall be valid only after written notice of granting such waiver is received from the Department.

Waivers granted shall:

1. be on a case-by-case basis;
2. may require an offset fee;
3. consider the cumulative effects of the waiver policy; and
4. ensure no adverse impact on the downstream watercourse.

2.8 Variances

The Department may grant a written variance from any requirement of the Stormwater Management ordinance if there are exceptional circumstances applicable to the site such that strict adherence will result in unnecessary hardship and not fulfill the intent of the ordinance. A written request for variance shall be provided to the Department and shall state the specific variances sought and reasons for their granting. Alternative best management practices (see Attachment D) may be approved as variances. The Department shall not grant a variance unless and until the applicant provides sufficient justification.

Applicants who meet the requirements for a variance may be required to pay an offset fee as described in Attachment C.

Requests for variances related to compliance with the runoff pollution reduction requirements in the Critical Area shall be submitted to and processed by the Baltimore City Department of Planning.

2.9 Master Plans

Master Plans for stormwater management are encouraged by the Department. Master plans are appropriate where development will occur over a period of time on a site. A Master Plan developed for the purpose of implementing site–wide stormwater management practices shall:

A. Include detailed hydrologic and hydraulic analyses to determine hydrograph timing;

B. evaluate both quantity and quality management;

C. include cumulative impact assessment of institutional development;

D. identify existing flooding and receiving stream channel conditions;

E. be presented at a reasonable scale (dictated by the size of area in the analysis);

F. specify where on-site or off-site quantitative and qualitative stormwater management practices and watershed improvement are (to be) implemented;

G. be consistent with the General Performance Standards for Stormwater Management in Maryland found in Section 1.2 of the Design Manual;

H. be consistent with local watershed management plan(s), and

I. be approved by the the Department.

Development consistent with an approved Master Plan may not require a new or separate stormwater management permit. For example, building a road (that was completely designed and specified in the Master Plan) or a stormwater management pond does not require a separate permit. Developing a site within the Master Plan area may require a new application and may require site specific BMPs for water quality and recharge volumes.

Master plans approved before the effective date of the stormwater management ordinance (July 27, 2002) may be implemented as designed until July 27, 2004. After July 27, 2004, site plans or the master plan must be revised to include water quality and recharge volumes according to the Design Manual. Quantity control will not have to be changed.

2.10 Redevelopment

The stormwater management ordinance and State Design Manual recognize that redevelopment does not allow the same stormwater management opportunities as new development. Redevelopment is defined as development where the existing land use is industrial, commercial or multifamily. The ordinance requires a 20 percent reduction in

impervious area. Where a 20 percent reduction in impervious area cannot be achieved, runoff from 20 percent of the existing impervious area must be treated using water quality BMPs.

Most projects in Baltimore City will be redevelopment projects. The following polices will apply to stormwater management plans that are covered by the stormwater management ordinance applicable to redevelopment (City ordinance 02-367 § 23-7).

1. Stormwater management plans for redevelopment shall be consistent with the Design Manual except that the recharge, channel protection storage volume, and overbank flood protection volume requirements do not apply unless required by the Department.
2. All redevelopment projects shall reduce existing impervious areas impacted within project limits by a minimum of 20 percent. Where project site conditions prevent the reduction of impervious area, then stormwater management practices shall be implemented to provide qualitative control for a minimum of 20 percent of the project's predevelopment impervious area. When a combination of impervious area reduction and stormwater practice implementation is used, the combined reduction and treated areas shall be equal to, or exceed, 20 percent of the predevelopment impervious area within the project limits. The necessary water quality volume to be treated will be calculated as follows:

   The area of imperviousness to be treated shall be calculated using the runoff formula for the entire site and the imperviousness fraction shall be the impervious area to be treated (maximum of 20 percent of the existing impervious area) divided by the total site area.

   For example, on a 10 acre site, that is 50 percent impervious, the required reduction in impervious area is

   impervious area = .5 (10 acres) = 5 acres
   reduction = 20% (5 acres) = 1 acre

   If the impervious area cannot be reduced, then the required water quality treatment volume is calculated as

   WQv = P Rv A

   where

   P = 1 inch of precipitation (per Design Manual)
   Rv = .05 + .009 (I), runoff coefficient
   A = 10 acres (site area)
   I = 0.1 x 100, (1 acre required area to be treated)/10 acres x 100

   thus

   Rv = .05 + .009 (10) = 0.1400
   WQv = (1) (0.14) (10) = 1.40 acre-in

0.1167 acre-ft
1830 cu ft

If only some of the required reduction in impervious area may be achieved, say 0.8 acre with a total of 4.2 acres of impervious area remaining, then the required WQv is

I =.02 x 100 = 2, (0.2 acres remaining area to be treated)/10 acres x100
Rv = .05 + .009 (2) = .0680
WQv = (1) (.0680) (10) = 0.680 acre-in
0.0047 acre-ft
206 cu ft

3. If a net increase in impervious area occurs for the project, the increased impervious area shall be considered new development and shall follow Stormwater Management Criteria, Section 2.4 of this Manual. Additionally, water quality shall be provided for 20 percent of the project's predevelopment impervious area.

   EXAMPLE #1: A new building and parking garage are constructed on an existing one (1) acre paved parking lot. The footprint of the new building and parking garage is one and a half (1.5) acres and completely covers the footprint of the existing 1.0 acre parking lot. The total water quality required equals 0.7 acres [0.5 acres for the new impervious, plus 0.2 acres for redevelopment (20 percent of the predevelopment impervious area)].

   EXAMPLE #2: A new building and parking garage are constructed on an existing, paved parking lot. The footprint of the new building and parking garage is one and a half (1.5) acres and covers one half (1/2) acre of the existing 1.0 acre parking lot (the remaining ½ acre parking lot will remain undisturbed). The total water quality required equals 1.1 acres [1.0 acre for the new impervious, plus 0.1 acres for redevelopment (20 percent of the ½ acre predevelopment impervious area replaced by new impervious)].

4. When a redevelopment project changes the site runoff characteristics, in a manner that increases the discharge rate, channel protection volume and overbank flood protection volume may be required by the Department.
5. If the site area (project limits) is in doubt (this may be an issue for redevelopment), contact the Department before filing the concept plan.
6. The existing land use will be the most intensive use while in the same ownership. An industrial, commercial, or multifamily building may be demolished and the vegetation planted and then redeveloped at a later time and the project will be a redevelopment for the purposes of stormwater management if the property has remained in the same ownership. If the land is sold after the demolition, the site will be considered undeveloped for stormwater management purposes

2.11 Critical Area Requirements

Development within the Critical Area (within 1000 feet of the shoreline) is subject to the requirements of the Critical Area Program as detailed in the Baltimore City Critical Area Management Program document. There are specific requirements for the reduction of pollutants in runoff. Appendix D-4 of the State Design Manual details a step-by-step approach to calculate compliance with these requirements.

The requirements of the Stormwater Management Ordinance still apply and must be met. The water quality offset fee required for a waiver of the water quality treatment requirement is not applicable, however, it is replaced by the Critical Area Program fee where the 10 percent pollutant removal requirement cannot be met.

When the offset fee for the stormwater management best management practice is higher than the offset fee for the Critical Area Program, the difference must be paid to the Department.

3 Permits, Fees, Security

3.1 Permit Requirement.

A grading or building permit may not be issued by the Department or HCD for any parcel or lot unless a stormwater management plan has been approved or waived by the the Department as meeting all the requirements of this Ordinance. Where appropriate, a building permit may not be issued without:

A. Recorded easements for the stormwater management facility and easements to provide adequate access for inspection and maintenance from a public right-of-way;

B. A recorded stormwater management maintenance agreement; and

C. A performance bond.

3.2 Permit Fees.

Non-refundable permit fees for plan review, offsets, and stormwater permits, will be collected by the Department in addition to the usual fee charged for processing a grading or building permit, at the time the stormwater management plan or application for waiver is submitted. The permit fees provide for the cost of plan review, administration, and management of the permitting process, and inspection of all projects subject to this Ordinance. Projects not required to obtain a grading or building permit shall be exempt from such permit fees**.**

A schedule of permit fees is provided in Attachment E. This fee schedule may be amended from time to time.

3.3 Permit Suspension and Revocation.

Any grading or building permit issued by the Department or HCD may be suspended or revoked by the Department after written notice is given to the permittee by the Department for any of the following reasons:

A. Any violation(s) of the conditions of the stormwater management plan approval.

B. Changes in site runoff characteristics upon which an approval or waiver was granted.

C. Construction is not in accordance with the approved plan.

D. Noncompliance with correction notice(s) or stop work order(s) issued for the construction of the stormwater management facility.

E. An immediate danger exists in a downstream area in the opinion of the Department representative.

3.4 Permit Conditions.

In granting the plan approval, the Department may impose such conditions that may be deemed necessary to ensure compliance with the provisions of this Ordinance and the preservation of the public health and safety.

3.5 Offset Fees

Offset fees will be required of applicants who cannot meet the requirements of the stormwater management ordinance. Offset fees may also be required of applicants who are only in partial compliance with the requirements. Attachment C details these offset fees.

3.6 Bonding Requirements and Procedures

3.6.1 Performance Bond

The Department shall require from the applicant a surety or cash bond, irrevocable letter of credit, or other means of security acceptable to Baltimore City prior to the issuance of any building and/or grading permit for the construction of a development requiring a stormwater management facility. The amount of the security shall not be less than the total estimated construction cost of the stormwater management facility. This estimate shall be prepared by the applicant and submitted with the plan. The bond required in this section shall include provisions relative to forfeiture for failure to complete work specified in the approved stormwater management plan, compliance with all of the provisions of the Stormwater Management ordinance, and other applicable laws and regulations, and any time limitations. The bond shall not be fully released without a final inspection of the completed work by the Department, submission of "As-built" plans, and certification of completion by the Department that the stormwater management facilities comply with the approved plan and the provisions of the Stormwater Management ordinance. A procedure may be used to release parts of the bond, pro-rated upon completion and acceptance of the various stages of development and construction as specifically delineated, described, and scheduled on the required plans and specifications. The applicant shall notify the Department upon completion of each stage that the facility is ready for inspection. The procedures used for partially releasing performance bonds must be specified by the Department in writing prior to stormwater management plan approval. Sample instructions and forms for letters of credit and bonds are provided in Attachment E.

4 Inspection

4.1 Inspection Schedule and Reports.

Before work can begin, the Contractor must receive a written notice from the Department, Stormwater Management Section. The Environmental Engineering Inspections Section must be notified of the various stages of work to be done on the facility. Call 410 396-6513 prior to 10:00 AM on the proceeding day to arrange for the inspection.

A preconstruction meeting must be held between the contractor and the Department to review plans and answer questions regarding construction and/or inspection procedures.

A description of all materials, source of materials, and the name of suppliers must be furnished if not included in construction specifications.

Inspections shall be conducted by the Department, its authorized representative, or certified by a professional engineer licensed in the State. Written inspection reports shall be made of the periodic inspections necessary during construction of stormwater management systems to ensure compliance with the approved plans. Geotechnical engineers must monitor earth work.

Written inspection reports shall include:

i. The date and location of the inspection;
ii. Whether construction was in compliance with the approved stormwater management plan;
iii. Any variations from the approved construction specifications; and
iv. Any violations that exist.

The owner/developer and on site personnel shall be notified in writing when violations are observed. Written notification shall describe the nature of the violation and the required corrective action.

No work shall proceed until the Department inspects and approves the work previously completed and furnishes the developer with the results of the inspection reports as soon as possible after completion of each required inspection, as detailed in Section 2.12.2

4.2 Inspection Requirements During Construction.

At a minimum regular inspections shall be made and documented at the following specified stages of construction:

1) For Ponds:

a) Upon completion of excavation to sub-foundation and when required, installation of structural supports or reinforcement for structures, including but not limited to:

i) Core trenches for structural embankments

ii) Inlet and outlet structures, anti-seep collars or diaphragms, and watertight connectors on pipes; and

iii) Trenches for enclosed storm drainage facilities;

b) During placement of structural fill, concrete, and installation of piping and catch basins;

c) During backfill of foundations and trenches;

d) During embankment construction; and

e) Upon completion of final grading and establishment of permanent stabilization.

2) Wetlands – at the stages specified for pond construction in of this section, during and after wetland reservoir area planting, and during the second growing season to verify a vegetation survival rate of at least 50 percent.

3) For infiltration trenches:

a) During excavation to subgrade;

b) During placement and backfill of under drain systems and observation wells;

c) During placement of geotextiles and all filter media;

d) During construction of appurtenant conveyance systems such as diversion structures, pre-filters and filters, inlets, outlets, and flow distribution structures; and

e) Upon completion of final grading and establishment of permanent stabilization;

4) For infiltration basins – at the stages specified for pond construction in this section and during placement and backfill of underdrain systems.

5) For filtering systems:

a) During excavation to subgrade;

b) During placement and backfill of underdrain systems;

c) During placement of geotextiles and all filter media;

d) During construction of appurtenant conveyance systems such as flow diversion structures, pre-filters and filters, inlets, outlets, orifices, and flow distribution structures; and

e) Upon completion of final grading and establishment of permanent stabilization.

6) For open channel systems:

a) During excavation to subgrade;

b) During placement and backfill of under drain systems for dry swales;

c) During installation of diaphragms, check dams, or weirs; and
d) Upon completion of final grading and establishment of permanent stabilization.

7) For nonstructural practices – upon completion of final grading, the establishment of permanent stabilization, and before issuance of use and occupancy approval.

4.3 Enforcement

The Department may, for enforcement purposes, use any one or a combination of the following actions:

1. A notice of violation shall be issued specifying the need for a violation to be corrected if stormwater management plan noncompliance is identified;
2. A stop work order shall be issued for the site by the approving agency if a violation persists;
3. Bonds or securities may be withheld or the case may be referred for legal action if reasonable efforts to correct the violation have not been undertaken; or
4. In addition to any other sanctions, a civil action or criminal prosecution may be brought against any person in violation of the Stormwater Management subtitle or the Stormwater Management ordinance.

Any step in the enforcement process may be taken at any time, depending on the severity of the violation.

Once construction is complete, two (2) prints and one (1) reproducible mylar copy of as-built drawings shall be submitted to the Environmental Engineering Section. The as-built drawings shall be affixed with a State of Maryland Registered Professional Engineer's written certification (see Attachment H) that the as-built drawing truly represents field conditions including, but not limited to locations, sizes, diameters, line and grade, and elevations. The Department may require additional information.

A notice of construction shall be submitted within 30 days of construction completion. Attachment I shows the notice of completion form.

5 Maintenance

5.1 Maintenance Inspection.

6) The Department shall ensure that preventative maintenance is performed by inspecting all stormwater management systems. Inspection shall occur during the first year of operation and at least once every 3 years thereafter. In addition, a maintenance agreement between the owner and the approving agency shall be executed for privately owned stormwater management systems. The maintenance agreement is provided in Attachment G.

B. Inspection reports shall be maintained by the Department for all stormwater management systems.

C. Inspection reports for stormwater management systems shall include the following:

1) The date of inspection;
2) Name of inspector
3) The condition of:
    a) Vegetation or filter media;
    b) Fences or other safety devices;
    c) Spillways, valves, or other control structures;
    d) Embankments, slopes, and safety benches;
    e) Reservoir or treatment areas;
    f) Inlet and outlet channels or structures;
    g) Underground drainage;
    h) Sediment and debris accumulation in storage and forebay areas;
    i) Any nonstructural practices to the extent practicable; and
    j) Any other item that could affect the proper function of the stormwater management system.
4) Description of needed maintenance.

D. After notification is provided to the owner of any deficiencies discovered from an inspection of a stormwater management system, the owner shall have 30 days or other time frame mutually agreed to between the approving agency and the owner, to correct the deficiencies. The Department shall then conduct a subsequent inspection to ensure completion of the repairs.

E. If repairs are not undertaken or are not found to be done properly, then enforcement procedures described in Section 2.12.1 shall be followed by the Department.

F. If, after an inspection by the Department, the condition of a stormwater management facility presents an immediate danger to the public health or safety, because of an unsafe condition or improper maintenance, the Department shall

take such action as may be necessary to protect the public and make the facility safe. Any cost incurred by the Municipality shall be assessed against the owner(s), as provided in Section 2.15.

5.2 Maintenance Agreement

Prior to the issuance of any building permit for which stormwater management is required, the Department shall require the applicant or owner to execute an inspection and maintenance agreement binding on all subsequent owners of land served by a private stormwater management facility. Such agreement shall provide for access to the facility at reasonable times for regular inspections by the Department, or its authorized representative to ensure that the facility is maintained in proper working condition to meet design standards.

The agreement shall be recorded by the applicant and/or owner in the land records of Baltimore City.

The agreement shall also provide that, if after written notice by the Department to correct any nonconformance with an approved plan, satisfactory corrections are not made by the owner(s) within a reasonable period of time, not to exceed 30 days, unless extended for good cause shown, the Department, or its designee, may perform all necessary work to place the facility in proper working condition. The owner(s) of the facility shall be assessed the cost of the work and any penalties. This may be accomplished by revoking the maintenance bond or placing a lien on the property, which may be placed on the tax bill and collected as ordinary taxes by the Department of Finance.

5.3 Maintenance Responsibility.

The owner of the property on which work has been done pursuant to this Ordinance for private stormwater management facilities, or any other person or agent in control of such property, shall maintain in good condition and promptly repair and restore all grade surfaces, walls, drains, dams and structures, vegetation, erosion and sediment control measures, and other protective devices. Such repairs or restoration and maintenance shall be in accordance with approved plans.

A maintenance schedule shall be developed for the life of any stormwater management facility and shall state the maintenance to be completed, the time period for completion, and who shall perform the maintenance. This maintenance schedule shall be printed on the approved stormwater management plan.

5.4 Maintenance Bond

The Department requires a performance bond for stormwater structural stormwater management BMPs that are in private ownership. The amount of the bond will be the estimated cost of five years of maintenance including all mowing, periodic inspection and a prorated cost of maintenance that would not be performed in a five year period, such as pond dredging. The bond shall be for a five-year period. Attachment E contains sample forms for bonds or other financial assurance documents.

ATTACHMENT A

Baltimore City Stormwater Management Ordinance

ATTACHMENT B

BALTIMORE CITY DEPARTMENT OF PUBLIC WORKS
APPLICATION FOR STORMWATER CONCEPT PLAN APPROVAL

BALTIMORE CITY DEPARTMENT OF PUBLIC WORKS
APPLICATION FOR STORMWATER CONCEPT PLAN APPROVAL

Date of Submittal_____

GENERAL INFORMATION:

Approval is required prior to submission of construction drawings for technical storm-water approval for all proposed development in Baltimore City. Submit the completed form and a site plan showing topography and vicinity) map to the Department of Public Works, Bureau of General Services, Engineering Division, Stormwater Management Services. Space is provided at the end of this form for answers to questions. Attach additional information as necessary. You are encouraged to contact the Development center at 410-396-4840 if you have any questions.

Property Tax Account Number or Complete Property Address:_____
_____
_____

Project Name:
_____
_____

Applicant Name, Address and Phone:
_____
_____
_____
_____

Engineer's Name, Address and Phone
_____
_____
_____
_____

Owner's Name, Address and Phone
_____
_____
_____
_____

TYPE OF DEVELOPMENT (Check as Applicable)

____ Single Family Residential ____ Commercial ___ Institutional

____ Road Improvements ____ Residential (all others) ___ Industrial

____ Other _____

____ Redevelopment

Locator Page & Grid_____ 200' Sheet_____

Zoning _____

Total Site Acreage _____

Current impervious area on-site _____

Proposed impervious area on-site _____

Will site discharge directly to tidal waters? (yes or no) _____

Will site discharge to public storm drain? (yes or no) _____

Please include the following items in your submission:

____ Narrative describing project including project purpose.

____ Location map including scale and north arrow.

____ Drainage area maps. Show drainage areas for all site runoff on suitable scale topographic map (1"=200' preferred). Drainage area map must include at least 100 feet outside site boundary and 100 feet downstream of outfall. Show time of concentration pathway and label. Include soil types. Include scale and north arrow.

____ Hydrologic calculations. Include time of concentration, runoff curve number, area, and reference to drainage area map for each subarea. Show how predevelopment peak flows were calculated.

____ Site plan. Include proposed development features, property lines, setbacks, topography, flood plain limits, environmental buffers, storm drains, sewers, rights-of-way, streams, bays, and other relevant features. Show proposed stormwater management BMPs, and outfall location.

____ Calculations showing compliance with stormwater management requirements. These will include unified stormwater sizing criteria calculations (water quality requirements,

recharge capacity requirements, channel protection volume requirements, peak flow requirements), and peak flow after development with and without proposed BMPs.

____ Waiver requests, if applicable. If requesting a waiver from any stormwater management requirement include waiver request and rationale.

This application must be prepared and signed by a registered Professional Engineer or Land Surveyor and accompanied by the appropriate review fee (see Attachment B)

SUBMITTED BY:

_____ _____
Signature Date

_____ _____
Printed Name MD P.E. or LS #

_____
Firm

ATTACHMENT C

Baltimore City Department of Public Works
Stormwater Management Offset Fee Schedule

Baltimore City Department of Public Works
Stormwater Management Offset Fee Schedule

Applicants who receive waivers or variances from the stormwater management requirements of Baltimore City will be required to pay offset fees.

Fee In-lieu of Waiver
New Projects - not redevelopment

Channel protection volume	$2,500 per increased impervious acre
Overbank flood control	$7,500 per increased impervious acre Not applicable to direct tidal discharge
Extreme Flood Control	$10,000 per increased impervious acre
Water Quality and Recharge Volume	estimated cost of practice that would have been practical for the site

Offset Fee for a Variance
The offset fee shall be no more than 75 percent of the estimated cost of the quantity or quality control that would have been practical for the site.

Critical Area offset fees are calculated by the Department of Planning and are in addition to the offset fees calculated by the Department.

ATTACHMENT D

ULTRA URBAN BMP DESIGN CRITERIA

ATTACHMENT E

STORMWATER MANAGEMENT PERMIT REVIEW
AND PENALTY FEE SCHEDULE
BALTIMORE CITY
DEPARTMENT OF PUBLIC WORKS

TYPE	FEE
SWM Concept Review Fee	$500
SWM Plan Review for 2 acres or less, waivers or simple projects	$2500
SWM Plan Review for more than 2 acres	$4000
SWM Master Plan Review	$8000
Critical Area Review	$1000
Civil Fines for Minor Infractions (each day is a separate offense)	$500 per offense
Criminal Penalties (each day is a separate offense)	$1000 per offense
Miscellaneous charges - not provided for elsewhere	$35 per hour for inspection
Miscellaneous charges - not provided for elsewhere	$60 per hour for engineering review

Fees collected by Baltimore City Department of Public Works.

ATTACHMENT E-1

A. INSTRUCTIONS FOR BOND

1. Performance Bonds Surety (Insurance Company Bonds), Letter of Credit, Certified Check, Cash or Assignment of Credit

All performance bonds will be 100% of construction cost.

2. Labor/Material Bond

a. 50% of cost of a Performance Bond. This may be a Surety, Letter of Credit, Cash or Assignment of Account.

b. No labor or material bond required for construction costs under $50,000.00.

c. All of the above will be accompanied by three (3) each of the proper forms signed with original signatures and original Notary Public per form.

3. The bond number will be the same number as the public stormwater system permit (i.e., SD33333A).

4. See instructions for authorized Bank and how to fill out form.

5. All bonds and filled out-forms are to be returned to this office to be processed. No permit will be issued until the bond is completed and accepted.

6. All bonds and completed forms will be transmitted by this office to the County Office of Law except cash bonds which will be transmitted by this 'office to the Treasury Office with an in-house letter of transmittal (white, yellow and pink). Legal and Treasury will keep the white and return the yellow and pink with signed forms. Yellow with forms will be filed in Storm Drain jacket. Pink with forms will be sent to the Engineer.

B. INSTRUCTIONS FOR BANKS/BONDING COMPANIES:

SURETY BONDS: (Requires only the bond forms)

1. Surety/Bonding Company will date bond document in upper right-hand corner.
2. Surety/Bonding Company will check appropriate space and insert their bond number.
3. Surety/Bonding Company will type in Corporation name in last paragraph.
4. Surety/Bonding Company will type in Corporation name at lower right-hand corner.

5. Attorney-in-Fact will sign and include Agency Address & Certification/License No.
6. Counter-signature by Maryland Resident Agent (if required by Maryland law).
7. Surety/Bonding Company must furnish a Power of Attorney for each bond.
8. Power-of-Attorney must have current date and include raised seal.

LETTER OF CREDIT: (Requires letter of credit from bank/bond form)

1. Bank will prepare Letter(s) of Credit on Bank's letterhead in accordance with format and requirements previously approved by Prince George's County Off ice of Law.

SAVINGS ACCOUNT: (Requires Assignment form/bond form)

1. Bank to complete date on first line. Name and address of bank on line 2.
2. Bank to fill in account number being assigned to Prince George's County.
3. Bank to type in Bank's name (above signature blocks).
4. Signature and title of officer of bank, with witness on left side of signature.
5. Notary Public to complete top portion of Acknowledgment for Bank's signature
6. Contractor to sign where indicated, including title.
7. Witness to signature.
8. Notary Public to complete lower section of Acknowledgment for contractor’s signature.

CASH BOND:

(Requires bond form only)

1. Permittee to sign bond document in lower right-hand corner.
2. Witness to signature.
3. Notary public to complete Acknowledgment section.

C. INSTRUCTIONS FOR PRIVATE DEVELOPER

1. In all cases, except corporate surety bond, permittee will fill in date in upper right-hand corner of bond document.
2. Permittee will check appropriate space for type of security being offered.
3. Permittee to sign in lower right-hand corner. Signature must include title of person and date of signature.
4. Witness to signature.
5. Acknowledgment portion of bond is to be complete by a Notary Public.

PLEASE NOTE: Any Bank or lending institution that wishes to execute an Irrevocable Letter of Credit in behalf of Baltimore City, Maryland, must first submit a "Letter of Agreement" with the County Office of Law. NO LETTERS

ATTACHMENT E-2

OF CREDIT WILL BE ACCEPTED UNTIL THE LETTER OF AGREEMENT HAS BEEN SUBMITTED AND APPROVED.
Also attached is the acceptable form of letter of credit.

SAMPLE IRREVOCABLE STANDBY LETTER OF CREDIT

ISSUER DATE OF ISSUE:

LETTER OF CREDIT NO :_____

BENEFICIARY APPLICANT

Mayor and City Council
100 North Holliday Street
Baltimore, MD 21202

Authorized Representative: Director of Public Works, Manager, Baltimore, MD

EXPIRY DATE

RE: Permit_____ Bond_____

Dear Sir(s):

We hereby issue this Irrevocable Standby Letter of Credit in favor of Baltimore City, Maryland (the "City"), which is available by one or more sigh drafts drawn on us accompanied by the following:

(1) The original of the Letter of Credit.

(2) A written statement signed by the authorized representative of the County that (1) the draft is drawn under Issuer's Standby Letter of Credit No. _____ in connection with permit _____, bond _____ ; (2) the requirements for discharge of the bond have not been satisfied; and (3) the amount of the draft is _____.

.

The expiry date of this Letter of Credit shall be automatically extended at each expiry date for an additional calendar year unless the authorized -representative of the City shall receive notice of non-extension by registered mail, return receipt requested, no less than forty-five (45) days prior to such expiry date.

ATTACHMENT E-3

This Letter of Credit sets forth the full terms of Issuer's Obligation to the City. It is separate from and shall not be subject to or supplemented or modified by any agreement, which refers to this Letter of Credit or to which this Letter of Credit relates.

Except as otherwise stated, this Letter of Credit is governed by the Maryland Uniform Commercial Code and is subject to the "Uniform Customs and Practice for Documentary Credits" (1983 Revision) International Chamber of Commerce Publication No. 400. In case of conflict between the Maryland Uniform Commercial Code and the Uniform Customs and Practice for Documentary Credits, the Maryland Uniform Commercial Code shall control.

We hereby agree to honor each draft drawn under and in compliance with the terms of this Letter of Credit if duly presented at the address of Issuer given above or at a branch office of Issuer within Baltimore City on or before the expiry data set forth above.

ATTACHMENT E-4

(SAMPLE)
STORMWATOR MANAGEMENT PERFORMANCE BOND NUMBER _____ -PB

DATE: _____

RE: PERMIT NO. _____ for construction related to
SUBDIVISION/ ADDRESS: _____ _____

KNOW ALL MEN BY THESE PRESENTS THAT:

As a condition precedent to issuance of the above Permit (the "Permit), PERMITTEE ___ _____ , hereby binds itself and its successors and assigns, to pay to Baltimore City, Maryland (the "City") the full amount of _____
($_____) subject to the conditions stated below. To secure said payment, Permittee has provided the County with the following Security in the full amount of this Bond:

_____Irrevocable Letter of Credit No._____ from _____ Bank
(Check one) _____ Assignment of Account No. _____with _____Bank
_____Surety Bond. No. _____
_____Cash, County to hold in non-interest escrow

The condition of this Bond is that if Permittee shall fully perform the following requirements in a manner satisfactory to the City, then this Bond shall be discharged, but otherwise it shall remain in full force and effect:

1. Complete within the prescribed time limits all work required under the terms and conditions of the Permit, including the application, plans and specifications, as approved by the City, and Subtitle - of the Baltimore City Code (the "Ordinance").

2. Provide and maintains the Security in full force and effect until all work under this Permit, including stormwater management facilities, where applicable, is completed and accepted by the City.

3. Indemnify and save harmless the City from all expenses, damages, claims, and actions arising from or relating to the performance or nonperformance of the work under the Permit by Permittee or its agents, employees, or subcontractors.

If Permittee fails to satisfy any of the above Requirements, the City shall enforce this Bond and draw upon the Security for up to the full amount thereof unless Permittee promptly completes, and has accepted, by the City, all work required under this Bond, the City should not thereby incur any liability to complete the work. If the Permittee afterwards completes the work as required, the City shall return the Security or its proceeds less the amount of any claims, damages, or costs incurred by the City in connection with this Bond.

If the City is prevented from drawing upon the Security, Permittee shall pay interest on the unpaid amount of the demand at the rate of ten percent (10%) per annum. If suit is filed to collect on this Bond or the Security, Permittee shall pay the costs of the collection, including attorney's fees at the rate of $60 per hour.

SURETY _____binds itself and its successors and assigns to pay the full amount of this Bond in accordance with and subject to the terms and conditions set forth above.

SIGNED AND SEALED on the date set forth above.

PERMITTEE_____

_____

BY:_____(SEAL)
WITINESS PRINT
NAME_____

TITLE_____

DATE:_____

SURETY_____(SEAL)

_____

BY:_____
WITNESS (Attorney-In-Fact)

APPROVED: AGENCY
NAME:_____

ADDRESS:_____

_____

_____

Certification/License no._____

_____ Counter-signed by Maryland
Resident Agent
Director of Public Works (if required by Maryland law)

_____

_____
County Attorney

ACKNOWLEDGEMENT

State of _____
County of _____

On this _____ day of _____, 20__, before me a Notary Public of the State and County aforesaid, personally appeared _____who acknowledged that he/she is the - _____of the Permittee identified in the above Bond and that being so authorized he/she executed the above Bond for and on behalf of the Permittee.

_____

Notary Public

My Commission expires:_____

ATTACHMENT D-5

(SAMPLE)

LABOR & MATERIALMAN'S BOND NUMBER _____- LM

Date_____

RE: Permit No. _____ for construction related to Subdivision/Address: _____

KNOW ALL MEN BY THESE PRESENTS THAT:

As a condition precedent to the approval and/or issuance of the above permit (the "Permit), PERMITTEE

_____

hereby binds itself and its successors and assigns, to pay to Baltimore City, Maryland (the "City") the full amount of

_____

($_____) subject to the conditions stated below. To secure said payment, Permittee has provided the County with the following Security in the full amount of this Bond:

_____Irrevocable Letter of Credit No. _____
from_____

_____

_

_____Surety Bond No. _____
_____Assignment of Account No. _____
_____Cash, County to hold in non-interest escrow

The condition of this Bond is that if Permittee fulfills the requirements listed below in a manner satisfactory to the City, this Bond shall be discharged, but otherwise it shall remain in full force and effect:

1. Comply with all requirements of the above Permit and Subtitle - of the Baltimore City Code.

2. Promptly make payment to all persons supplying labor and materials, including lessors of the equipment to the extent of the fair rental value thereof, for all work under the Permit, which includes the application, plans and specifications, as approved by the City.

3. Provide and maintain the Security in full force and effect until all work under the Permit has been accepted by the City and for one calendar year thereafter or until all claims against the Bond have been resolved, whichever is the later, unless the Permittee earlier provides proof satisfactory to the City of payment of all its obligations for labor and materials set forth above.

4. Indemnify the City against all costs, claims and damages asserted against or incurred by the City in connection with this Bond.

If Permittee fails to satisfy any of the above requirements, the City shall enforce this Bond and draw upon the Security for up to the full amount thereof unless Permittee promptly provides the City substitute security or proves to the City that Permittee has satisfied all requirements. In making a demand under this Bond, the City shall not thereby incur any liability to satisfy the Requirements except in regard to valid claim on the Bond. Upon satisfaction or discharge of all claims under this Bond and reimbursement of any coats incurred in connection with this Bond, the City shall return any remaining funds to the Permittee.

If payment is not made within thirty (30) days, Permittee shall pay interest on the unpaid amount of the demand at a rate of ten percent (10%) per annum. If suit is filed to collect on this Bond or the Security, Permittee shall pay the costs of the collection, including attorney's fees at the rate of $60 per hour.

SURETY _____binds itself and its successors and assigns to pay the full amount of this Bond in accordance with and subject to the terms and conditions set forth above.

SIGNED AND SEALED on the date set forth above.

PERMITTEE_____

_____

BY:_____

WITINESS Signature and Title

DATE:_____

SURETY_____

_____

BY:_____

WITNESS (Attorney-In-Fact)

AGENCY

NAME:_____

ADDRESS:_____

_____

_____

Certification/License no._____

Branch Manager for Department

Counter-signed by Maryland Resident Agent
Director of Public Works (if required by
Maryland law)

_____

_____

County Attorney

ACKNOWLEDGEMENT

State of _____ County of _____

On this _____ day of _____, 20__, before me a Notary Public of the State and County aforesaid, personally appeared _____who acknowledged that he/she is the - _____of the Permittee identified in the above Bond and that being so authorized he/she executed the above Bond for and on behalf of the Permittee.

_____

My Commission expires Notary Public

ATTACHMENT E-6

(SAMPLE)
IRREVOCABLE ASSIGNMENT OF ACCOUNT

This Agreement is made this _____ day of _____, 20__, by _____ (the “Bank”) and _____ (the “Permittee”), for the use and benefit of Baltimore City, Maryland, a body corporate and politic of the State of Maryland (the "County") .

For valuable consideration, receipt and sufficiency of which is hereby acknowledged, the above Parties agree as follows:

As security for Bond No._____, which the City requires as a condition to the issuance of Permit No._____ , Permittee hereby assigns to the City, Account No. _____, in the amount of $_____, which Account is presently maintained at the Bank.

The Bank agrees that it will not disburse any part of the Account without prior written approval of the City. Upon written request of the City and without the consent or approval of the Permittee, and not withstanding any objection on the part of the Permittee, the Bank shall pay over to the City the entire amount of the Account upon thirty (30) days of such request.

WITNESS the hands and seals of the Parties hereto on the data first above written.

BANK_____

_____
BY:_____(SEAL)
WITINESS PRINT
NAME_____

TITLE_____

PERMITTEE:_____

_____
BY:_____(SEAL)
WITINESS PRINT
NAME_____

TITLE_____

ACKNOWLEDGEMENT

State of _____
County of _____

On this _____ day of _____, 20__, before me a Notary Public of the aforementioned State and City, personally appeared _____who acknowledged to me that he/she is the _____of the Bank identified in the above Assignment and that being so authorized he/she executed the above Assignment for and on behalf of the Bank.

_____
Notary Public
My Commission expires:_____

ATTACHMENT F

STORMWATER MANAGEMENT PLAN CHECKLIST

STORMWATER MANAGEMENT PLAN CHECKLIST

_____

DATE

OBJECTIVE

The reasons for this checklist are:

1. **To guide the engineer with developing a complete submittal.**
2. **To guide the Baltimore City Environmental Engineering Section's plan reviewers in their review.**

LEGEND FOR REVIEW CHECKLIST

Ö - Accepted **X** - Not Accepted **Inc** - Incomplete
NA - Not Accepted **R** - Required

Review #_____ ESD #_____ Plan #_____ Contract # _____

Project Name_____
Address_____
Official Property Owner_____
Owner's Mailing Address_____
Engineer's Mailing Address_____
Engineer's Phone Number_____

GENERAL SUBMITTAL REQUIREMENTS
FINAL PLAN
1. The Final Plan must include this checklist, compiled by the consultant. **2. The submittal must consist of _2_ copies of all documents, including the SWM Report and the SWM Drawings, with signed P.E. seal.** **3. The Final Plan submittal must concur with the approved concept plan.**

STORMWATER MANAGEMENT - FINAL PLAN CHECKLIST	
Status[1]	**Item Description**
I	**SWM REPORT** must be on 8½" x 11", with maps included under same cover
	1. Narrative – should address the following
	a. Existing and proposed site conditions

STORMWATER MANAGEMENT - FINAL PLAN CHECKLIST

	b. Descriptions of all water courses, impoundments, and wetlands on or adjacent to the site or into which the stormwater directly flows
	c. Site Drainage design methodology
	d. Unified stormwater sizing criteria
	e. BMP selection and final locations
	f. Geotechnical investigation results and recommendations
	g. Waivers and variances, if any
	h. Relevant supporting information
	2. Computations
	a. Unified stormwater sizing criteria computations and summary table listing Wqv, Cpv, Op, Qf, and other pertinent information
	b. Hydrologic computations/modeling results
	c. Hydraulic computations
	d. Structural computations
	e. Pertinent design information
	3. Outfall
	a. Outfall location, size, adequacy
	b. Outfall condition and stability
	c. Outfall statement describing existing field condition and velocity
	d. Outfall analysis – post-development flow rate and velocity
	e. Non-erosive discharge?

Status[1]	Item Description
II	**SWM DRAWING**
	1. Cover Sheet
	a. Vicinity map at scale 1"=2000'
	b. Earthwork tabulation
	c. Zoning/setbacks
	d. Outfall statement
	e. Stormwater Management Note
	f. Impervious Area Tabulation
	g. Owner/Developer name, contact person and telephone number
	h. Engineer/Design Professional signature and seal
	i. Engineer/Design Professional organization and telephone number
	2. DRAINAGE AREA MAPS –Image must extend at least 100 feet outside the site and 100 feet downstream of the proposed outfall at a scale of 1"=200'. Provide the following information:
	a. Pre-development site conditions, land use and runoff flow paths
	b. Post-development features and Tc flow paths

STORMWATER MANAGEMENT - FINAL PLAN CHECKLIST

	c. Site property lines
	d. Critical Area boundaries, if any
	e. Structures, pavement, and other impervious area
	f. SCS soil type
	g. Runoff Curve Numbers
	h. Time of concentration (Tc) paths
	i. Study points and flow direction arrows, including roof drainage
	j. Pipes and other conveyance devices, with sizes
	k. Proposed locations of stormwater management control/devices
	l. Public and private systems limits
	3. Drawing set at scale 1"=10', 20', 30', 40', or 50' – Existing/proposed features to be included are:
	a. Topography showing existing and proposed conditions, including sufficient downgradient/offsite area to show outfall analysis study points
	b. Contours (2' interval maximum) and all grading
	c. Street names/route numbers
	d. Property lines with bearing and distances
	e. Rights-of-way, easements, and ownership
	f. Building setback limits
	g. Proposed improvements – building or other structures

Status[1]	**Item Description**
	h. Impervious surface – pavement, curb lines, sidewalks
	i. Vegetation, landscape areas, areas to be sodded
	j. Soil types, soil boring locations
	k. Wetland and Stream Buffer limits
	l. Forest conservation areas
	m. 100-year floodplain, if applicable, and any on-site wetlands
	n. Existing Utilities – checked against record drawings, and verified in field and/or with utility companies
	o. Proposed utilities – shown with proper symbols
	p. Legend of drawing lines and symbols
	q. North arrow
	r. Drawing scales
	s. Proposed drainage facilities (grassed swales, roof drain locations, pipes, infiltration devices, outfall, etc.) each identified with sizes
	t. Construction details for all components of proposed drainage system and stormwater management facilities
	u. Drain structures numbered S-1, S-2, M-1, M-2, etc. starting from downstream end of system, and inlet structures numbered I-1, I-2, etc. starting from downstream end of system
	v. Structure schedules, as needed
	w. Storm drain profile including hydraulic grade line

	x. Pond profile along embankment and through spillway
	y. Pond profile or other BMP sections and details
	z. BMP dimensions, setbacks, easements, easements, etc.
	aa. BMP access
	bb. Construction specifications
	cc. Sequence of construction
	dd. Site tabulation – total disturbed area, predevelopment impervious, total impervious area
	ee. Table showing unified sizing criteria volumes required
	ff. Table of materials to be used for stormwater management facility planting
	gg. Maintenance schedule for private SWM practices
	hh. Owner/developer certification
	ii. Engineer's certification
	jj. Maintenance and liability certification
	kk. As-built certification signature block to be completed after project completion.
III	**CRITICAL AREA**
	a. Worksheets
	b.

ATTACHMENT G

MAINTENANCE AGREEMENT

DECLARATION OF COVENANTS

Inspection/Maintenance Agreement For Stormwater

Management Facility

This Declaration, made this _____ day of 20____, between _____ hereinafter referred to as the “Owner" of the following property:

Baltimore, Maryland, hereinafter referred to as the "Property" and City of Baltimore, Maryland, hereinafter referred to as the "City".

W I T N E S S E T H:

The Owner, with full authority to execute deeds, mortgages, other covenants, and with all rights, titles and interests in the Property described above, does hereby covenant with the City as follows:

1. The Owner hereby agrees to provide maintenance for the stormwater management facility hereinafter referred to as the “Facility", located on and serving the above-described Property to ensure that such Facility is and remains in proper working condition in accordance with the approved plans on file with the City, with the design standards, and with the law and applicable regulations.

The Facility shall be maintained on a periodic schedule as noted on the approved plans on file with the City. The Owner from time to time shall provide the City, on demand, with a statement certifying compliance with the maintenance responsibilities for the Facility.

2. The Owner hereby grants to the City a non-exclusive easement in, over and through the Property, as shown on the plat attached hereto as Exhibit A and by reference made a part hereof, for the purposes of providing access from public right-of-ways to the Facility and to allow for inspection, maintenance, and repairs to the Facility.

3. The Owner hereby grants to the City, or its agents its right of entry to the Facility for the purpose of inspecting or maintaining the Facility.

4. If, after reasonable notice by the City, the Owner shall fail to maintain the Facility in accordance with the approved plans, standards, laws, and regulations, the City may perform all necessary repair and maintenance work, and the City may assess the Owner for the cost of the work and any applicable penalties. The cost of the work and any applicable penalties may be placed

on the property tax bills of said Property and collected as ordinary taxes by the City.

5. The Owner hereby indemnifies and saves the City harmless from any and all claims for damages to persons or property arising from the maintenance, repair, operation or use of the Facility other than claims resulting from City's negligence.

6. The covenants contained herein shall run with the land and shall bind the Owner, its heirs, executors, administrators, successors and assignees, and shall bind all present and subsequent owners of the Property.

7. This Declaration shall be recorded in the City Land Records.

IN WITNESS WHEREOF, this Declaration has been signed and sealed as of the day and year first above written.

WITNESS:

_____
(SEAL)

By:

STATE OF MARYLAND, CITY OF BALTIMORE, TO WIT:

I HEREBY CERTIFY that on this _____ day of _____, 20_____, before me, the subscriber, a Notary Public of the State of Maryland, in and for Baltimore City, personally appeared _____, the _____ of _____, and acknowledged this Declaration of Covenants to be the act and deed of

_____
Notary Public

My Commission Expires: _____

CERTIFICATION

THE UNDERSIGNED hereby certifies that the above instrument was prepared by an attorney admitted to practice before the Court of Appeals of Maryland, or under the supervision of an attorney admitted to practice before the Court of Appeals of Maryland, or by one of the parties named in the instrument.

,

AFTER RECORDING, PLEASE RETURN TO:

ATTACHMENT H

CERTIFICATION STATEMENTS

Engineer's Certification Stormwater Management

I hereby certify that this plan has been prepared by me or under my supervision and meets the minimum standards of the Baltimore City Department of Public Works requirements and specifications.

_____

Print Name Address Phone Number

_____

Signature Date License #

Developer's / Landowner's Certification Stormwater Management

I/we certify that all proposed work shown on these construction drawing(s) and on the approved Sediment Control drawings(s) will be accomplished pursuant to these plans. I/we also understand that it is my/our responsibility to have the construction supervised and certified including the submittal of "As-Built" plans within thirty (30) days of completion, by a registered professional engineer.

_____

Owner/Developer Address Phone Number

_____

Signature Date

As-Built Certification Stormwater Management

I hereby certify that the facility shown on this plan was constructed as shown on the "as-built" plans and complies with the approved plans and specifications.

_____

Print Name Address Phone Number

_____

Signature Date License #

Maintenance and Liability Stormwater Management

Maintenance of the Stormwater Management Facility and appurtenant drainage structures shall be the responsibility of the property owner. The property owner shall also be fully liable for all damages or injuries that may be sustained by any person or property as a result of any failure or malfunction of the Stormwater Management Facility and appurtenances.

_____

Owner/Developer Address Phone Number

_____

Signature Date

ATTACHMENT I

NOTICE OF COMPLETION

MARYLAND DEPARTMENT OF THE ENVIRONMENT
WATER MANAGEMENT ADMINISTRATION
NOTICE OF CONSTRUCTION COMPLETION FORM

Jurisdiction _Baltimore City_____

Structure/Project Name _____

Structure/Project Address _____

_____

Location:
Northing (or Latitude)* _____

Easting (or Longitude)* _____

ADC Map Coordinates* _____

State Watershed Designation*_____

Structure Drainage Area:
Facility Drainage Area (acres) _____ Total Project Area (acres) _____

Landuse Code* _____ Runoff Curve Number _____

Structure Description:
Structure Type (Check One):

Detention Structure (Dry Pond)	____	Dry Well	_____
Extended Detention, Dry	____	Extended Detention, Wet	_____
Infiltration Basin	____	Infiltration Trench	_____
Oil Grit Separator/WQ Inlet	____	Porous Pavement	_____
Retention Structure (Wet Pond)	____	Sand Filter	_____
Shallow Marsh (Artificial Wetland)	____	Underground Storage	_____

Other (Describe) _____

Facility Site Location: On-Site Facility _____ Off-Site Facility _____

Permit Approval Date _____ Permit or Structure Number _____

Construction Completion Date _____

General Comments: _____

_____

_____

The person completing this form should provide the following information:

Name: _____ Title _____ Phone _____

Signature: _____ Date: _____